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09/114,665	07/13/1998	THOMAS R. BIELER	6550000013	9522

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ART UNIT	PAPER NUMBER
1742	23

DATE MAILED: 08/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

MK-23

Office Action Summary	Application No.	Applicant(s)	
	Examiner	Group Art Unit	

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication .
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

☑ Responsive to communication(s) filed on 5/3/03.

☑ This action is **FINAL.**

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 1 1; 453 O.G. 213.

Disposition of Claims

☑ Claim(s) 27-37, 41, 43-48, 52, 54-77 is/are pending in the application.

Of the above claim(s)____ is/are withdrawn from consideration.

☐ Claim(s)____ is/are allowed.

☑ Claim(s) 27-37, 41, 43-48, 52, 54-77 is/are rejected.

☐ Claim(s)____ is/are objected to.

☐ Claim(s)____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The proposed drawing correction, filed on____ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on____ is/are objected to by the Examiner.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 11 9(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number)____

☐ received in this national stage application from the International Bureau (PCT Rule 1 7.2(a)).

*Certified copies not received:____.

Attachm nt(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s).____

☐ Interview Summary, PTO-413

☐ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other____

Office Acti n Summary

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:
The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 54-58, 61, and 75-77 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 61 is indefinite because in step (c), the unit of "5% to 40%" is unclear.

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:
The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 66 and 73 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

6. The cooling rate "100 °C/minute" is not supported by the specification as originally filed. Page 7, lines 19-20 of the instant specification supports only "100 °C/sec."

Claim Rejections - 35 USC § 103

7. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 27-30, 33-36, 41, 53, 59, 62-64, and 66-67 are rejected under 35 U.S.C. 103(a) as obvious over USP 5527628 to Anderson et al (col. 4, lines 15-27, col. 3, lines 18-32, and col. 5, lines 59 to col. 6, line 59).

10. The Anderson et al reference(s) disclose(s) the features including steps of combining a solder with the components of the intermetallic phases such as Cu and Ag to form a mixture (col. 5, line 59 to col. 6, line 12). The mixture can be formed as composite solder wire, solder sheet, solder ingot, and solder powder (col. 5, lines 60-62). The composite solder melt can be chill cast (col. 5, lines 67 to col. 6, line 2) to form an ingot which could be used form ultrafine solder powder by melt atomization

(col. 6, lines 14-15). But, Anderson et al do not disclose the claimed cooling rate and do not explicitly disclose the intermetallic particle size. Anderson et al disclose the solder powder is produced by conventional atomization techniques (col. 6, lines 14-50) which is known in the art of cited reference that the cooling rate is at least 100 °C/sec. The examiner takes the official notice that conventional atomization methods would have the cooling rate at least 100 °C/sec. Moreover, in paragraph bridging col. 6 and 7, Anderson discloses slow cooling rate would coarsening the intermetallic phases. Since the instant claimed solder elements and atomization method are overlapped by the cited reference; consequently, the particle size as recited in the instant claims would have inherently possessed by the teachings of the cited references. Furthermore, Anderson discloses the intermetallic phases are dispersed in the ultrafine solder powder which has size less than 25 μm (col. 6, lines 3-44). Therefore, the burden is on the applicant to prove that the product of the prior art does not necessarily or inherently possess characteristics attributed to the claimed product. In re Spade, 911 F.2d 705, 708, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

In re Best, 195 USPQ, 430 and MPEP § 2112.01.

> "Where the claimed and prior art products are identical or substantially identical in structure or composition, or are produced by identical or substantially identical processes, a prima facie case of either anticipation or obviousness has been established, In re Best,

> 195 USPQ 430, 433 (CCPA 1977). 'When the PTO shows a sound basis for believing that the products of the applicant and the prior art are the same, the applicant has the burden of showing that they are not.'
> In re Spada, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990). Therefore, the prima facie case can be rebutted by evidence showing that the prior art products do not necessarily possess the characteristics of the claimed product. In re Best, 195 USPQ 430, 433 (CCPA 1977)."

11. Claims 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over USP 5527628 to Anderson et al as applied to claims above, and further in view of USP 5520752 to Lucey, Jr. et al.

12. The claimed subject matter as is disclosed and rejected above by the cited reference(s) except for the different intermetallic phases and cooling methods. However, Lucey, Jr. et al in col. 3, line 64 to col. 4, line 5 teaches the other claimed intermetallic phases in the eutectic solder alloys and their cooling methods are conventional methods to produce conventional solders. It has been held that combining known ingredient having known functions, to provide a composition having the additive effect of each of the known functions is within realm of performance of ordinary skill artisan. In re Castner, 186 USPQ 213 (217). The use of conventional materials to perform their known functions in a conventional process is obvious. In re Raner, 134 USPQ 343 (CCPA 1962).

13. Claims 37, 43-48, 52, 54-58, 60, 61, 65, and 68-77 are rejected under 35

U.S.C. 103(a) as being unpatentable over USP 5527628 to Anderson et al as applied to claims above, and further in view of Gibson et al.

14. The claimed subject matter as is disclosed and rejected above by the cited reference(s) except for the volume of the intermetallic phase. However, Gibson et al in abstract teach 20 volume percent intermetallic phase would improve fatigue resistance. Therefore, it would have been obvious to one having ordinary skill in the art of the cited references at the time the invention was made to employ the teachings as taught by Gibson et al in order to improve the solder fatigue resistance. In re Venner, 120 USPQ 193 (CCPA 1958), In re LaVerne, et al., 108 USPQ 335, and In re Aller, et al., 105 USPQ 233.

Response to Arguments

15. Applicant's arguments filed May 3, 2003 have been fully considered but they are not persuasive.

16. Applicants' argument as set forth in pages 9-12 is noted. But, Anderson's teaching is not limit Cu content to 1.7 wt.% or 2.2 wt.%. Applicants' attention is directed to col. 5, lines 22-25 which discloses Cu content is from about 1 to about 4 wt.%. Furthermore, Anderson teaches "The Sn, Ag and contents can be varied to provide a controlled, selected melting temperature range above the ternary eutectic melting temperature (217 °C) for a particular solder application." (See col. 4, line 51

to col. 5, line 12.)

17. Applicants argue that the claimed solder composition is non-eutectic (See paragraph bridging pages 11 and 14 of the instant remarks.) But, applicants' argument is found inconsistent with instant Figure 2B which discloses the Cu_6Sn_5 intermetallic phase is distributed throughout the eutectic Sn/Ag matrix (see page 11, lines 28-33 of the instant specification).

18. Applicants' argument with respect to Gibson and Lucey is noted. But, contrarily to applicants argument, Anderson teaches "The Sn, Ag and contents can be varied to provide a controlled, selected melting temperature range above the ternary eutectic melting temperature (217 °C) for a particular solder application." (See col. 4, line 51 to col. 5, line 12.)

Conclusion

19. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Applicant is reminded that when amendment and/or revision is required, applicant should therefore specifically point out the support for any amendments made to the disclosure. See 37 C.F.R. § 1.121.

Examiner Correspondence

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Ip whose telephone number is (703) 308-2542. The examiner can normally be reached on Monday to Friday from 5:30 A.M. to 2:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Roy V. King, can be reached on (703)-308-1146.

The facsimile phone numbers are (703) 872-9310 (non-final Official Paper only), (703) 872-9311 (after-final Official Paper only), and (703) 305-7719 (Unofficial Paper only). When filing a FAX in Technology Center 1700, please indicate in the Header (upper right) "Official" for papers that are to be entered into the file, and "Unofficial" for draft documents and other communication with the PTO that are not for entry into the file of the application. This will expedite processing of your papers.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0651.

SIKYIN IP
PRIMARY EXAMINER
ART UNIT 1742

S. Ip
July 14, 2003